

Abstract Submitted
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A Tunable Terahertz Detector Based On Self Assembled Plasmonic Structure on a GaAs 2DEG CHEJIN BAE, DEEPU GEORGE, ROHIT SINGH, ANDREA MARKELZ, SUNY Buffalo, DEPARTMENT OF PHYSICS, UNIVERSITY AT BUFFALO, THE STATE UNIVERSITY OF NEW YORK TEAM — To improve detector sensitivity, tunability and remove polarization dependence, we develop the gated grid plasmonic structure on 2DEG by using nanosphere self-assembly lithography. The measured transmission clearly is not following Drude response, but rather has three sharp resonances corresponding fundamental, 3rd, and 5th harmonics of plasmon resonance respectively. Measurements at 80K show a large transmission change of 25%. We also confirmed a magneto plasmon dispersion of this device. In this paper we will discuss the radiative damping effect which affects enhanced absorption at the higher harmonics mode relative to fundamental [1] and inductive grid resonance of this self-assembled plasmonic structure by demonstrating an angular dependence of transmission due to 2D plasmon[2]. [1] V. Popov et al., J. Appl. Phys. **94**, 3556 (2003) [2] T. W. Ebbesen et al., Nature, **391**, 667 (1998)

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